

REMARKS

Initially, in response to the issue noted by the Examiner with regard to the drawings in section 3 on page 2 of the Office Action, please find provided herewith a copy of the original drawings marked in red to indicate proposed changes made thereto, and proposed replacement formal drawings which incorporate these changes. The Examiner is respectfully requested to approve these drawings.

Claims 35 and 47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '982 in view of Fortson and Gilchrist. Claims 41 and 52 were rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '982 in view of Fortson and Stralser. Claims 36, 42, 48 and 53 were rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '982 in view of Fortson and either Gilchrist or Stralser, and further in view of Yuasa et al. Claims 37, 43, 49 and 54 were rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '982 in view of Fortson and either Gilchrist or Stralser, and further in view of Pitora et al. And, claims 30-40, 44-46, 50, 51, 55 and 56 were rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '982 in view of Fortson, Pitora et al. and either Gilchrist or Stralser, and further in view of Hess et al. These rejections are respectfully traversed for the following reasons.

Initially, it is respectfully submitted there would have been no motivation or suggestion for one having ordinary skill in the art to have combined the teaches of JP '982 and Fortson. It is appreciated that Fortson discloses a method and apparatus for mixing hydrogen and oxygen so as to avoid a potential explosion resulting from a mixture of these gases; however, JP '892 is not concerned with a potential explosion such that there would have been no reason to increase the pressure as suggested by the Examiner.

As expressed in the response filed July 14, 2003, were the method of JP '982 performed by the multiple tubular electrode construction of Gilchrist, then a very dangerous explosive atmosphere would result such that one having ordinary skill in the art would not have been motivated to use the device of Gilchrist to perform the method of JP '982. The teachings of Fortson are not sufficient to demonstrate that one having ordinary skill in the art would have found it obvious to practice the method of JP '982 in the device of Gilchrist.

Specifically, because of the different technologies with which JP '982 and Fortson pertain, it is respectfully submitted that one having ordinary skill in the art would not have gleaned anything from Fortson with regard to how a potentially explosive atmosphere could be prevented while performing hydrothermal electrolysis.

In this regard, JP '982 pertains to a method and apparatus for performing hydrothermal electrolysis at a temperature of 200°C. Fortson, on the other hand, is directed to a method and apparatus for mixing hydrogen and oxygen gas, wherein hydrogen is dissolved in water in cylinder 13 under a cooled condition while oxygen is dissolved in water in cylinder 15 under a cooled condition, and then after the hydrogen and oxygen have been dissolved in their respective cylinders, the water containing these dissolved gases is mixed together. Only after the mixing of the water is the water heated.

There is no suggestion in Fortson of dissolving hydrogen and oxygen in water at a high temperature and a high pressure, let alone during hydrothermal electrolysis. There is no suggestion in Fortson that hydrothermal electrolysis of an aqueous medium at a high temperature and high pressure would suppress oxygen and hydrogen production, so as to avoid a possible explosion when a surface area of an electrode used during the hydrothermal electrolysis is increased.

Accordingly, because Fortson is not related to hydrothermal electrolysis and provides no guidance as to whether an explosive condition could be prevented were method limitations thereof incorporated into the hydrothermal electrolysis operation of JP '982 when performed in the device of Gilchrist, one having ordinary skill in the art would not have been motivated to combine the teachings of JP '982, Fortson and Gilchrist.

The Examiner has additionally relied upon Henry's law for supporting the rejection of claims 35 and 47; however, it is respectfully submitted that a combination of JP '982, Fortson and Gilchrist, when considered in view of Henry's law does not have resulted in one having ordinary skill in the art arriving at Applicants' invention, i.e. that generation of hydrogen gas and oxygen gas can be suppressed during a high-temperature and a high-pressure hydrothermal electrolysis operation even when electrodes of increased surface area are used for the operation.

In this regard, Henry's law teaches that when a gas component is partially soluble in a liquid, solubility of the gas component in the liquid increases in proportion to an increase of a partial pressure of the gas component. In other words, when concentrations of hydrogen and oxygen which are dissolved in a medium are increased, partial pressure thereof are also increased. This condition, when viewed in conjunction with Faraday's law, would not lead one to believe that an explosive condition would be prevented by increasing the pressure of a hydrothermal electrolysis operation when electrodes having increased surface areas are used to perform the hydrothermal electrolysis.

Specifically, according to Faraday's law, an amount of substances converted by electrode reaction is in proportion to electrical charge, i.e. is a function of the surface area of the electrodes used to create the electrical charge. Accordingly, even if the pressure of a hydrothermal electrolysis operation were increased, when electrodes of increased surface area are used during this operation, there is no guarantee that an explosive condition will be prevented.

Thus, when a hydrothermal electrolysis operation, under high temperature and high pressure and utilizing electrodes of increased surface area, is viewed along with each of Henry's law and Faraday's law, it is respectfully submitted that one having ordinary skill in the art would not have expected hydrogen gas and oxygen gas to have been sufficiently suppressed so as to prevent an explosive condition.

Accordingly, claims 35 and 47 are not obvious over a combination of JP '982, Fortson and Gilchrist.

With regard to the remaining rejections, the Examiner's attention is respectfully directed to Applicants' response filed July 14, 2003 for an explanation as to why these rejections are in error.

In view of the above remarks, it is respectfully submitted that the present application is in condition for allowance and an early Notice of Allowance is earnestly solicited.

If after reviewing this Amendment, the Examiner believes that any issues remain which must be resolved before the application can be passed to issue, the Examiner is invited to contact the Applicants' undersigned representative by telephone to resolve such issues.

Respectfully submitted,

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